

广东土牛膝的化学成分^{*}

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摘要: 广东土牛膝为菊科泽兰属植物华泽兰 (*Eupatorium chinense*) 的干燥根。从其甲醇提取物中共分离得到 11 个化合物, 其中 eupatorin A (**1**) 为一新化合物, 经波谱学方法鉴定为 (threo)-3-*O*-acetyl-1-(4-hydroxy-3-methoxyphenyl)-2-[4-(3-hydroxy-1-(*E*)-propenyl)-2, 6-dimethoxyphenoxy] propyl- β -D-glucopyranoside。已知化合物分别鉴定为 (threo)-3-hydroxy-1-(4-hydroxy-3-methoxyphenyl)-2-[4-(3-hydroxy-1-(*E*)-propenyl)-2, 6-dimethoxyphenoxy]-propyl- β -D-glucopyranoside (**2**), ardisiacrispin A (**3**), ardisiacrispin B (**4**), euparone (**5**), 3-(2, 3-dihydroxy-isopen-tyl)-4-hydroxyacetophenone (**6**), 12, 13-dihydroxy-euparin (**7**), gymnastone (**8**), *N*-(2'-hydroxy-tetracosanosyl)-2-amino-1, 3, 4-trihydroxy-octadec-8-(*E*)-ene (**9**), stigmasterol (**10**) 和 stigmasterol-3-*O*- β -D-glucopyranoside (**11**)。化合物**2**—**4** 为首次从菊科植物, **5**—**8** 为首次从泽兰属植物中分离得到。

关键词: 广东土牛膝; 化学成分; Eupatorin A

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Chemical Constituents of Guangdong Tu-Niu-Xi (*Eupatorium chinense*, Compositae)

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Abstract: One new compound, namely eupatorin A (**1**), was isolated from the methanolic extract of Guangdong Tu-Niu-Xi, the dried roots of *Eupatorium chinense* (Compositae). Its structure was determined to be (threo)-3-*O*-acetyl-1-(4-hydroxy-3-methoxyphenyl)-2-[4-(3-hydroxy-1-(*E*)-propenyl)-2, 6-dimethoxyphenoxy] propyl- β -D-glucopyranoside on the basis of detailed spectroscopic analysis. In addition, ten known compounds, including (threo)-3-hydroxy-1-(4-hydroxy-3-methoxyphenyl)-2-[4-(3-hydroxy-1-(*E*)-propenyl)-2, 6-dimethoxyphenoxy] propyl- β -D-glucopyranoside (**2**), ardisiacrispin A (**3**), ardisiacrispin B (**4**), euparone (**5**), 3-(2, 3-dihydroxy-isopen-tyl)-4-hydroxyacetophenone (**6**), 12, 13-dihydroxy-euparin (**7**), gymnastone (**8**), *N*-(2'-hydroxy-tetracosanosyl)-2-amino-1, 3, 4-trihydroxy-octadec-8-(*E*)-ene (**9**), stigmasterol (**10**) and stigmasterol-3-*O*- β -D-glucopyranoside (**11**) were also obtained. This was the first

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time that compounds **2**–**4** were reported from Compositae family, while **5**–**8** were isolated from the genus *Eupatorium*.

Key words: Guangdong Tu-Niu-Xi (*Eupatorium chinense*); Chemical constituents; Eupatorin A

Eupatorium chinense L. (Compositae) is mainly distributed in the south part of China. The dried roots, called Guangdong Tu-Niu-Xi, have been used medicinally for the treatment of coughing, fever, amygdalitis, diphtheria and other laryngological diseases in Guangdong Province, China, for a long time (Editorial Committee of Chinese Materia Medica, State Administration of Traditional Chinese Medicine of the P. R. C., 1999). Pharmacological studies showed that it had anti-inflammatory, analgesia, antiseptis and anticancer effects (Liu *et al.*, 2004; Mei and Wu, 2005). Numbers of sesquiterpenoids and sterols were reported from the whole plants (Yu and Kang, 1983; Kazuo *et al.*, 1982; Yang *et al.*, 2004; Yang *et al.*, 2005). As a part of our work on searching antiviral natural products from medicinal plants, particularly those used in the south part of China, a detailed chemical investigation on the air-dried roots of *Eupatorium chinense* was carried out, which led to the identification of 11 compounds. Their structures were identified by extensive NMR spectroscopic experiments, including ^1H and ^{13}C NMR, ^1H - ^1H COSY, HMBC, HMQC and ROSEY. Of them, compound **1** is a new phenylpropanoidal glycoside and named as eupatorin A. This paper describes the isolation and structure determination of these compounds.

1 Materials and Methods

1.1 General Experimental Procedures

Optical rotation was recorded on a P-1020 Polarimeter (JASCO, Tokyo, Japan). IR spectrum was measured on a Bruker Tensor 27 spectrometer with KBr pellets. UV spectrum was determined on a Shimadzu UV-2401PC spectrometer. ^1H and ^{13}C NMR, ^1H - ^1H COSY, HMQC, HMBC, and ROSEY spectra were recorded with Bruker AM-400 and DRX-500 spectrometers. Coupling constants were expressed in Hertz, and chemical shifts were given

on a δ (ppm) scale with TMS as an internal standard. FAB-MS were recorded on an AutoSpec 3000 spectrometer with glycerol as the matrix, in m/z HRESI-MS measurement was carried out on an API Qstar Pulsa LC/TOF spectrometer. TLC experiments were performed on silica gel H pre-coated plates (Qingdao Marine Chemical and Industrial Factory, China) and Rp-8 or Rp-18 pre-coated plates (Merck, Germany). Silica gel (200–300 mesh) (Qingdao Marine Chemical and Industrial Factory, China), MCI gel CHP20P (75–100 μm) (Mitsubishi Chemical Co., Ltd., Japan), Rp-8 gel, Rp-18 gel (40–60 μm) (Merck, Germany) and Sephadex LH-20 (25–100 μm) (Pharmacia Fine Chemical Co. Ltd) were used for column chromatography. Spots were detected by spraying with anisaldehyde-AcOH- H_2SO_4 -EtOH (3:7:1.5:5:135) followed by heating.

1.2 Material

The air-dried Guangdong Tu-Niu-Xi was supplied by Biomedicine Research & Development Centre at College of Life Science and Technology, Jinan University in 2007, and identified by Professor Wang Yi-Fei. A voucher specimen has been deposited in the Biomedicine Research & Development Centre at College of Life Science and Technology, Jinan University, Guangzhou, China.

1.3 Extraction and Isolation

The air-dried roots of Guangdong Tu-Niu-Xi (2.8 kg) were powdered and extracted with methanol under reflux for three times, three hours a time. The methanolic extract was concentrated under reduced pressure to afford a residue (72.5 g). The residue was applied on a silica gel column (60 $\times$ 6.0 cm), eluting with chloroform-methanol (1:0–0:1), to afford 12 fractions (Fr. 1–12). Fr. 1 was repeatedly chromatographed over silica gel ($\text{CHCl}_3/\text{MeOH}$ or petroleum ether/acetone), Sephadex LH-20 ($\text{MeOH}/\text{H}_2\text{O}$ or $\text{CHCl}_3/\text{MeOH}$), MCI gel CHP20P ($\text{MeOH}/\text{H}_2\text{O}$) and Rp-8 or Rp-18 gel ($\text{MeOH}/\text{H}_2\text{O}$) to afford compound **5** (22 mg). In the same way, compound **10** (55 mg) was obtained from Fr. 3; compounds **6** (18 mg) and **7** (96 mg) were yielded from Fr. 5; compounds **8** (9 mg) and **9** (40 mg) were isolated from Fr. 6; compound **11** (25 mg) was from Fr. 7, compound **1** (47 mg) was from Fr. 9, compound **2** (21 mg) was from Fr. 10, and compounds **3** (20 mg) and **4** (15 mg) were both from Fr. 12.

Eupatorin A (1) was obtained as colorless oil, $[\alpha]_D^{23}$ -20.8 (*c* 0.24, MeOH), IR $\nu_{\text{max}}^{\text{KBr}}$ (cm^{-1}): 3432, 2934, 2925, 1735, 1585, 1517, 1505, 1459, 1421, 1243, 1125, 1077, 1035; UV $\lambda_{\text{max}}^{\text{MeOH}}$ ($\log \epsilon$) (nm): 271 (4.02), 222 (4.53), 202 (4.83); ESI-MS (positive): 633 $[\text{M} + \text{Na}]^+$; HRESI-MS (positive): 633.2175 $[\text{M} + \text{Na}]^+$ (calcd. for 633.2159, $\text{C}_{29}\text{H}_{38}\text{O}_{14}\text{Na}$); ^1H NMR (acetone- d_6 , 500 MHz): δ_{H} 1.84 (3H, s, CO Me), 3.23 (1H, m, H-3''), 3.31 (1H, m, H-4''), 3.32 (1H, m, H-2''), 3.40 (1H, m, H-5''), 3.56 (1H, dd, $J = 9.5$, 5.5 Hz, Hb-6''), 3.74 (1H, br. d, $J = 9.5$ Hz, Ha-6''), 3.79 (1H, dd, $J = 12.0$, 6.0 Hz, Hb-9), 3.82 (3H, s, OMe-3), 3.85 (6H, s, OMe-2', 6'), 4.09 (1H, dd, $J = 12.0$, 2.5 Hz, Ha-9), 4.21 (2H, m, H-9'), 4.59 (1H, d, $J = 7.5$ Hz, H-1''), 4.60 (1H, m, H-8), 5.13 (1H, d, $J = 6.0$ Hz, H-7), 6.35 (1H, dt, $J = 5.5$, 16.0 Hz, H-8'), 6.54 (1H, d, $J = 16.0$ Hz, H-7'), 6.77 (2H, s, H-3', 5'), 6.79 (1H, d, $J = 8.0$ Hz, H-5), 6.96 (1H, dd, $J = 1.0$, 8.0 Hz, H-6), 7.13 (1H, d, $J = 1.0$ Hz, H-2); ^{13}C NMR (acetone- d_6 , 125 MHz): δ_{C} 20.6 (q, CO Me), 56.3 (q, OMe-3), 56.4 (q, OMe-2', 6'), 62.8 (t, C-6''), 63.1 (t, C-9'), 64.7 (t, C-9), 71.5 (d, C-4''), 75.2 (d, C-2''), 77.5 (d, C-5''), 77.7 (d, C-3''), 81.3 (d, C-7), 82.8 (d, C-8), 104.2 (d, C-1''), 104.4 (d, C-3', 5'), 112.1 (d, C-2), 115.2 (d, C-5), 121.0 (d, C-6), 130.0 (d, C-7'), 130.5 (d, C-8'), 131.1 (d, C-1), 134.1 (d, C-4'), 136.6 (d, C-1'), 147.0 (d, C-4), 147.8 (d, C-3), 154.0 (d, C-2', 6'), 170.9 (s, O C OMe).

(threo)-3-hydroxy-1-(4-hydroxy-3-methoxyphenyl)-2-[4-(3-hydroxy)-1-(*E*)-propenyl]-2, 6-di-methoxyphenoxy]propyl- β -D-glucopyranoside (2) was obtained as colorless oil, $\text{C}_{27}\text{H}_{36}\text{O}_{13}$, ESI-MS (positive): 591 $[\text{M} + \text{Na}]^+$; ^1H NMR (CD_3OD , 500 MHz): δ_{H} 3.18 (1H, m, H-3''), 3.20 (1H, m, Hb-6''), 3.32 (1H, m, H-4''), 3.32 (1H, m, H-2''), 3.36 (1H, m, H-5''), 3.60 (1H, m, Ha-6''), 3.60 (1H, m, Hb-9), 3.74 (1H, dd, $J = 2.5$, 12.5 Hz, Ha-9), 3.85 (3H, s, OMe-3), 3.87 (6H, s, OMe-2', 6'), 4.22 (2H, dd, $J = 1.0$, 5.5 Hz, H-9'), 4.29 (1H, dt, $J = 3.5$, 6.5 Hz, H-8), 4.59 (1H, d, $J = 7.5$ Hz, H-1''), 5.14 (1H, d, $J = 6.5$ Hz, H-7), 6.34 (1H, dt, $J = 5.5$, 16.0 Hz, H-8'), 6.55 (1H, d, $J = 16.0$ Hz, H-7'), 6.75 (1H, d, $J = 8.0$ Hz, H-5), 6.77 (2H, s, H-3', 5'), 6.92 (1H, dd, $J = 1.5$, 8.0 Hz, H-6), 7.08 (1H, d, $J = 1.5$ Hz, H-2); ^{13}C NMR (pyridine- d_5 , 125 MHz): δ_{C} 55.9 (q, OMe-3), 56.2 (q, OMe-2', 6'), 62.6 (t, C-6''), 61.6 (t, C-9), 62.9 (t, C-9'), 71.6 (d, C-4''), 75.9 (d, C-

2''), 78.5 (d, C-5''), 78.9 (d, C-3''), 80.8 (d, C-7), 86.4 (d, C-8), 104.4 (d, C-1''), 104.5 (d, C-3', 5'), 112.7 (d, C-2), 115.9 (d, C-5), 121.3 (d, C-6), 129.4 (d, C-8'), 131.1 (d, C-1), 131.4 (d, C-7'), 134.0 (d, C-4'), 136.7 (d, C-1'), 147.7 (d, C-4), 148.2 (d, C-3), 153.9 (d, C-2', 6'). (Kensaku *et al.*, 2002)

Ardisiacrispin A (3) was obtained as a white amorphous powder, $\text{C}_{52}\text{H}_{84}\text{O}_{22}$, FAB-MS (negative): 1059 $[\text{M}-1]^-$, 927 $[\text{M}-1-132]^-$, 765 $[\text{M}-1-132-162]^-$; ^1H and ^{13}C NMR data: similar to the data reported in Chaweewan *et al.* (1987) and Gottfried *et al.* (1989).

Ardisiacrispin B (4) was obtained as a white amorphous powder, $\text{C}_{53}\text{H}_{86}\text{O}_{22}$, FAB-MS (negative): 1074 $[\text{M}]^-$, 928 $[\text{M}-146]^-$, 765 $[\text{M}-1-146-162]^-$; ^1H and ^{13}C NMR data: similar to the data reported in Chaweewan *et al.* (1987).

Euparone (5) was obtained as a yellow amorphous powder, $\text{C}_{12}\text{H}_{10}\text{O}_4$, ESI-MS (positive): m/z 241 $[\text{M} + \text{Na}]^+$; ^1H NMR (CDCl_3 , 500 MHz): δ_{H} 2.60 (3H, s, H-13), 2.73 (3H, s, H-11), 7.08 (1H, s, H-7), 7.46 (1H, s, H-3), 8.17 (1H, s, H-4), 12.56 (1H, s, OH-6); ^{13}C NMR (CDCl_3 , 125 MHz): δ_{C} 25.2 (q, C-13), 25.6 (q, C-11), 99.1 (d, C-7), 111.9 (d, C-3), 117.2 (s, C-5), 118.5 (s, C-9), 125.7 (d, C-4), 152.5 (s, C-2), 158.8 (s, C-6), 162.2 (s, C-8), 186.7 (s, C-12), 202.8 (s, C-10). (Mahmoud *et al.*, 1974)

3-(2, 3-dihydroxy-isopentyl)-4-hydroxy-acetophenone (6) was obtained as colorless oil, $\text{C}_{13}\text{H}_{18}\text{O}_4$, EI-MS (positive): m/z 238 $[\text{M}]^+$, 220 $[\text{M}-18]^+$; ^1H NMR (CD_3OD , 400 MHz): δ_{H} 1.24 (3H, s, H-12), 1.25 (3H, s, H-13), 2.55 (3H, s, H-8), 2.55 (1H, m, Ha-9), 3.05 (1H, dd, $J = 2.0$, 14.0 Hz, Hb-9), 3.62 (1H, dd, $J = 2.0$, 10.5 Hz, H-10), 6.83 (1H, d, $J = 8.5$ Hz, H-5), 7.75 (1H, dd, $J = 2.5$, 8.5 Hz, H-6), 7.85 (1H, d, $J = 2.5$ Hz, H-2); ^{13}C NMR (CD_3OD , 100 MHz): δ_{C} 25.1 (q, C-12), 25.7 (q, C-13), 26.3 (q, C-8), 33.9 (t, C-9), 73.9 (s, C-11), 79.5 (d, C-10), 116.0 (d, C-5), 128.2 (s, C-3), 130.0 (d, C-6), 130.1 (s, C-1), 133.7 (d, C-2), 162.4 (s, C-4), 199.8 (s, C-7). (Sonia *et al.*, 1992)

12, 13-dihydroxyeuparin (7) was obtained as yellow crystals, $\text{C}_{13}\text{H}_{14}\text{O}_5$, EI-MS (positive): m/z 250 $[\text{M}]^+$, 219 $[\text{M}-31]^+$; ^1H NMR (CD_3OD , 400 MHz): δ_{H} 1.56 (3H, s, H-14), 2.66 (3H, s, H-11), 3.74 (2H, m, H-13), 6.71 (1H, s, H-3), 6.92 (1H, s, H-7), 8.10 (1H, s, H-4); ^{13}C NMR (CD_3OD , 100 MHz): δ_{C} 23.6 (q, C-14), 27.0 (q, C-11), 69.3 (t, C-13), 72.9 (s, C-12), 99.9 (d, C-7), 103.8 (d, C-3), 118.0 (s, C-5),

122.7 (s, C-9), 125.4 (d, C-4), 160.9 (s, C-6), 161.9 (s, C-8), 163.5 (s, C-2), 206.1 (s, C-10). (Hussein, 1992)

Gymnastone (8) was obtained as a yellow amorphous powder, $C_{13}H_{14}O_6$, ESI-MS (positive): 289 $[M+Na]^+$; ^1H NMR (pyridine- d_5 , 500 MHz): δ_H 2.58 (3H, s, H-11), 4.65 (2H, d, $J=11.1$ Hz, H-13), 4.60 (2H, d, $J=11.2$ Hz, H-14), 7.17 (1H, s, H-3), 7.18 (1H, s, H-4), 7.80 (1H, s, H-7), 12.63 (1H, s, OH-5); ^{13}C NMR (CD_3OD , 125 MHz): δ_C 26.9 (q, C-11), 66.2 (t, C-13, 14), 76.8 (s, C-12), 104.9 (d, C-3), 107.6 (d, C-4), 113.1 (d, C-7), 116.4 (s, C-6), 137.3 (s, C-9), 148.4 (s, C-8), 158.8 (s, C-5), 168.6 (s, C-2), 204.5 (s, C-2). (Nguyen *et al.*, 2004)

1.4 Acid Hydrolysis of Compound 1

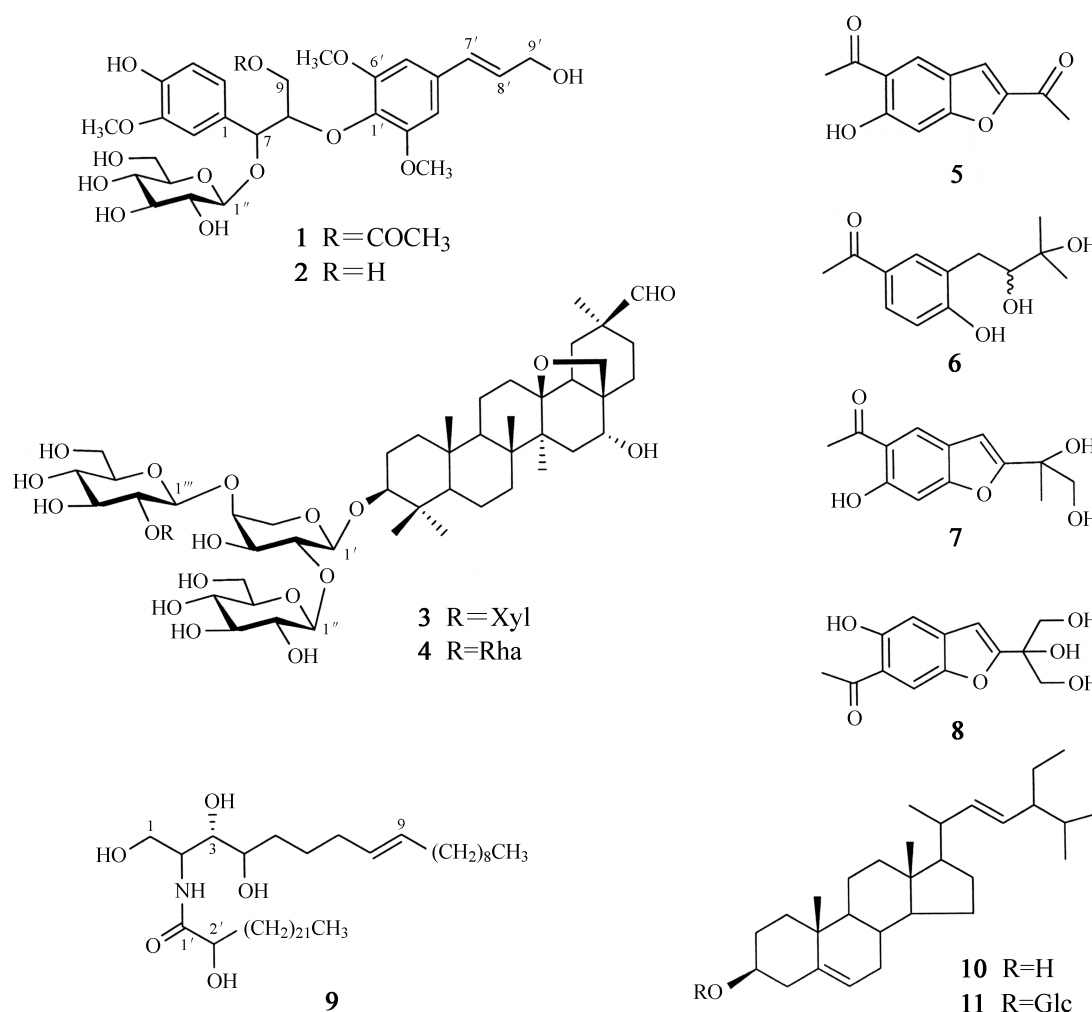
Compound **1** (8 mg) was hydrolyzed with 2 mol $\cdot$ L $^{-1}$ HCl-dioxane (1 : 1, 4 ml) under reflux for 4 h at 90°C. The reaction mixture was partitioned between H_2O and $CHCl_3$ (2 ml $\times$ 3) after cooling. The aqueous layer was neutralized with 2 M NaOH, dried, dissolved in pyridine and concentrated again to give the sugar residue. The sugar was analyzed by comparing *Rf* value with authentic sample on silica gel H pre-coated plates as D-glucose ($[\alpha]_D^{25}+9.7$ (c 0.16, H_2O)).

2 Results and Discussion

The methanolic extract of Guangdong Tuniu-Xi was subjected to repeated column chromatography over silica gel, Sephadex LH-20, MCI gel CHP20P, Rp-8 and RP-18 to yield 11 compounds (**1**–**11**). Compounds **2**–**11** were determined to be the known compounds (*threo*)-3-hydroxy-1-(4-hydroxy-3-methoxy-phenyl)-2-[4-(3-hydroxy-1-(*E*)-propenyl)-2, 6-dimethoxy-phenoxy]propyl- β -D-glucopyranoside (**2**) (Kensaku *et al.*, 2002), ardisiacrispin A (**3**) (Chaweewan *et al.*, 1987; Gottfried *et al.*, 1989), ardisiacrispin B (**4**) (Chaweewan *et al.*, 1987), euparone (**5**) (Mahmoud *et al.*, 1974), 3-(2, 3-dihydroxy-isopentyl)-4-hydroxy-acetophenone (**6**) (Sonia *et al.*, 1992), 12, 13-dihydroxy-euparin (**7**) (Hussein, 1992), gymnastone (**8**) (Nguyen *et al.*, 2004), *N*-(2'-hydroxy-tetracosanosyl)-2-amino-1, 3, 4-trihydroxy-octadec-8-(*E*)-ene (**9**) (Li *et al.*, 2003), stigmaterol (**10**) (Wang *et al.*, 2004) and stigmaterol-3-

O- β -D-glucopyranoside (**11**) (Wang *et al.*, 2004) on the basis of detailed spectroscopic analyses, together with comparison of their spectroscopic and physical data with reported ones (Fig. 1). It was the first time that compounds **2**–**4** were isolated from the Compositae family, while **5**–**8** were obtained from the genus *Eupatorium*.

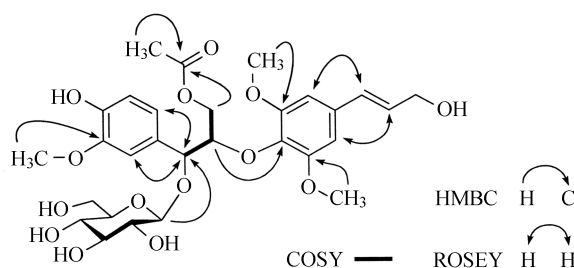
Eupatorin A (**1**) was obtained as colorless oil. Its molecular formula was determined to be $C_{29}H_{38}O_{14}$ by HRESI mass spectrum (m/z 633.2175 $[M+Na]^+$), containing 15 degrees of unsaturation. The UV absorptions at 271, 222 and 202 nm suggested the presence of conjugated structure in the molecule. The IR spectrum of **1** showed characteristic absorptions at 3431 and 1735 cm^{-1} , suggesting the presence of hydroxyl group and carbonyl group, and the absorptions at 1585, 1517, and 1505 cm^{-1} confirmed the existence of aromatic moiety. The ^1H and ^{13}C NMR spectral data of **1** showed the existence of a 1, 3, 4-trisubstituted phenyl [δ_H 6.79 (1H, d, $J=8.0$ Hz, H-5), 6.96 (1H, dd, $J=1.0$, 8.0 Hz, H-6), 7.13 (1H, d, $J=1.0$ Hz, H-2)], a 1, 3, 4, 5-tetrasubstituted phenyl (δ_H 6.77, 2H, s, H-3', 5'), a glucopyranosyl [δ_H 4.59 (1H, d, $J=7.5$ Hz, H-1''), δ_C 104.2, 75.2, 77.7, 71.5, 77.5 (each d, C-1'', C-2'', C-3'', C-4'', C-5''), 62.8 (t, C-6'')], two *trans*-coupled olefinic protons [δ_H 6.35 (1H, dt, $J=5.5$, 16.0 Hz, H-8'), 6.54 (1H, d, $J=16.0$ Hz, H-7')], three methoxyls [δ_H 3.82 (3H, s), 3.85 (6H, s)], two oxygen-bearing methylenes [δ_C 63.1, 64.7 (each t, C-9', 9)] and two oxygen-bearing methines [δ_C 81.3, 82.8 (each d, C-7, 8)]. In the ^1H - ^1H COSY spectrum of **1**, the correlations between H-7 (δ_H 5.13) and H-8 (δ_H 4.60), H-8 and Hb-9 (δ_H 3.78) were observed. In the HMBC spectrum of **1**, the correlations of δ_H 3.82 (OMe-3) with δ_C 147.8 (C-3) and δ_H 3.85 (OMe-2', 6') with δ_C 154.0 (C-2', 6') confirmed the positions of three methoxyl groups; the correlation between δ_H 4.59 (1H, d, $J=7.5$ Hz, H-1'') and δ_C 81.3 confirmed that the

Fig. 1 Structures of compounds **1** – **11**

glucopyranosyl unit located at C-7 and possessed a β -anomeric configuration; the correlation of H-8 (δ_{H} 4.60) with C-1' (δ_{C} 136.6) was also observed. The ROSEY correlations of δ_{H} 5.13 (H-7) with δ_{H} 7.13 (H-2) and δ_{H} 6.96 (H-6) assigned C-7 to be linked with the 1, 3, 4-trisubstituted phenyl group, while correlations of δ_{H} 6.77 (H-3', 5') with δ_{H} 6.54 (H-7') and δ_{H} 6.35 (H-8') confirmed that C-7' was located at C-4' (Fig. 2).

Comparison of the ^1H and ^{13}C NMR spectra of **1** with those of **2** indicated that these two compounds were quite similar with each other, except for an additional acetyl group [δ_{C} 20.6, 170.9; δ_{H} 1.84 (3H, s, $-\text{COCH}_3$)] appeared in compound **1**. The ESI-MS also showed that compound **1** had 42 mass units more than **2**, cor-

responding to an acetyl group. The HMBC correlations between H-9 (δ_{H} 3.79 and 4.09) and the acetyl carbonyl carbon (δ_{C} 170.9) indicated that the acetyl group located at C-9.

Fig. 2 The key 2D NMR correlations of compound **1**

The coupling constant (6.5 Hz) between H-7 and H-8 in compound **2** indicated a *threo*

type of relative configuration (Yuan and Li, 2003), and it is the same for compound **1** with a similar coupling constant of 6.0 Hz. Acid hydrolysis of compound **1** gave D-glucose ($[\alpha]_{\text{D}}^{23} + 9.7$) as sugar residue. The assignment of the proton and carbon signals was achieved by a combination of ^1H - ^1H COSY, HMBC, and ROSEY spectra. Thus, the structure of compound **1** was determined to be (*threo*)-3-*O*-acetyl-1-(4-hydroxy-3-methoxyphenyl)-2-[4-(3-hydroxy-1-(*E*)-propenyl)-2, 6-dimethoxy-phenoxy]propyl- β -D-glucopyranoside.

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